A Biogeographic Assessment of Stellwagen Bank National Marine Sanctuary

A Foundation for Monitoring Long-Term Changes in the Sanctuary

GOAL

The National Oceanic and Atmospheric Administration's (NOAA) Biogeography Program (BP) will collaborate with the National Marine Sanctuaries Program (NMSP) in order to conduct a biogeographic assessment of the marine region surrounding Stellwagen Bank National Marine Sanctuary (SBNMS). This work is intended to 1) support the management plan review process currently underway at the Sanctuary, and 2) provide baseline data for long-term monitoring and for management decision making. Selected biological and physical datasets of the region will be assembled into a GIS that will be used, in part, to inform discussions relating to the management plan review process. Additional datasets will be obtained, evaluated and integrated into a Biogeographic analysis of the Sanctuary and surrounding environs with the goal of identifying areas of ecological importance. As a result of the collaboration, the following products are anticipated 1) a website for the rapid dissemination of scientific data specifically tailored for management plan review discussions, 2) an analysis of the physical oceanographic conditions in the region, and 3) a Biogeographic assessment of key biological and physical relationships within the sanctuary.

BACKGROUND

Stellwagen Bank National Marine Sanctuary (SBNMS) extends from Cape Ann to Cape Cod across the mouth of Massachusetts Bay. Its 843 square miles encompass diverse topographic features, including the submerged areas of Stellwagen Bank and Basin, Tillies Bank and Basin, and the southern portion of Jeffrey's Ledge. Due to its varied seafloor topography and high primary productivity, the area is utilized by diverse assemblages of seabirds, endangered marine mammals, invertebrates, and fish species. It is a region of cultural significance, highlighted by the recent discoveries of several historic shipwrecks. The Sanctuary was designated in 1992 in order to better protect these and other unique biological, geological, oceanographic and cultural features of the region.

The NMSP is currently undertaking the first review of the SBNMS management plan since designation in 1992. This process will enter working group discussions beginning in September 2003. No new regulations have been added since designation, but the information base on the natural resources of the sanctuary has widened due to technological advancements and increased research activity in the region. The biogeographic study of SBNMS will take advantage of new spatial data sets that have recently become available so as to produce an integrative assessment. The integrative assessment will provide a catalyst for management plan review discussions, as well as provide a foundation for future biological studies within the sanctuary.

PROJECT OVERVIEW

The NCCOS Biogeography Program, in consultation with SBNMS and the NMSP, will conduct a spatially-explicit characterization of the physical and biological conditions within Stellwagen Bank NMS ecosystems. Preliminary efforts include the integration of existing coverages (i.e. sediment type, bathymetry, shoreline, and shipping lanes) into a GIS environment with select SBNMS supplied biological and human-use datasets. As working group discussions progress, maps and basic spatial analyses will be conducted on this data as requested by SBNMS staff. BP will generate a website which will provide informational content such as analytical results, scientific material, and working group logistical information to facilitate the productivity of working group meetings. The BP, in consultation with SBNMS science staff, will continue to obtain data on the biology, human use, and physical oceanography of the

area. A characterization of the physical oceanographic conditions of SBNMS will be conducted following an evaluation of the extent and compatibility of available data. Finally, the oceanographic assessment will be analyzed in concert with the biological and human use data sets to examine relationships between oceanography and the temporal and spatial dynamics of the ecosystem.

Questions to be addressed by this study include:

1. What data currently exists on the physical oceanography of SBNMS, and what are the general oceanographic patterns within the sanctuary?

2. Does an analysis of existing data reveal biologically meaningful and statistically significant patterns in the distribution of marine fauna and human activity?

3. How are species distributed spatially and temporally throughout the sanctuary in relationship to topographic, and physical oceanographic features?

4. Which areas or habitats are unique and productive (e.g. high diversity) and how are these areas utilized by living marine resources?

5. What significant gaps exist in our knowledge and information of biological and physical characteristics of the study area?

Contact Information

Biogeography Program

Principal Investigator: Tim Battista
Biological Oceanographer
301-713-3028 X171
Tim.Battista@noaa.gov

Analysis Lead: Lynn Takata
Marine BiologistX112
Lynn.Takata@Noaa.gov

Ann Borowik
GIS Analyst
301-713-3028 XTBD
Ann.Borowik@noaa.gov

Production Lead: Jamie Higgins
Physical Scientist
301-713-3028 x 163
Jamie.Higgins@noaa.gov

Data Integration Lead: Randy Clark
Marine Scientist
301713-3028 x157
Randy.Clark@noaa.gov

BP-NMSP Liaison: Matt Kendall
Marine Ecologist
301-713-3028 X144
Matt.Kendall@noaa.gov

Biogeography Program Manager: Mark Monaco
Marine Biologist
301-713-3028 X160
Mark.Monaco@noaa.gov

NCCOS/NMSP Liason

Larry Settle
Center for Coastal Fisheries and Habitat Research
252-728-8736
Larry.Settle@noaa.gov

SBNMS-NMSP

Craig MacDonald
SBNMS Sanctuary Manager
781-545-8026 x202
Craig.MacDonald@noaa.gov

James Lindholm
SBNMS Research Coordinator
781-545-8026 x206
James.Lindholm@noaa.gov

David Wiley
SBNMS Science Advisor
781-545-8026
David.Wiley@noaa.gov

John D. Crawford
SBNMS Science Advisor
781-545-8026
jud@psych.upenn.edu

NMSP Headquarters

Mitchell Tartt
NMSP GIS Coordinator
301-713-3125 X184
Mitchell.Tartt@noaa.gov

Ed Lindelof
NMSP Management Plan Review Coordinator
301-713-3125 X131
Edward.Lidelof@noaa.gov